



Application No: GB 9909319.7
Claims searched: 1-24

Examiner: E QUIRK
Date of search: 7 July 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): G1A(ADJA,ADJM,ADJP,ADJV,ADJX,ADMC,ADMX)

Int Cl (Ed.6): G01N(21/03, 21/05, 21/35, 21/59, 21/61, 33/00)

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	WO 93/13401 A1 (Gaztech) Figures and page 8 lines 2-12.	1-3,7-10, 22 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/01431

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N21/03 G01N21/31

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	<p>US 5 835 231 A (PIPINO ANDREW C R) 10 November 1998 (1998-11-10)</p> <p>column 1, line 20 - line 32 column 2, line 34 - line 36 column 4, line 57 - column 5, line 39 column 6, line 20 - line 26 column 7, line 6 - line 38 figure</p> <p style="text-align: center;">--- -/-</p>	<p>1, 3, 4, 8, 9, 11-14, 16, 20-22 5, 6, 10, 17-19, 23, 24</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

12 July 2000

Date of mailing of the international search report

20/07/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Navas Montero, E

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/01431

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 004, no. 074 (P-013), 30 May 1980 (1980-05-30) & JP 55 039049 A (MATSUSHITA ELECTRIC IND CO LTD), 18 March 1980 (1980-03-18) abstract	5,6,23, 24
Y	DE 42 14 840 A (DRAEGERWERK AG) 11 November 1993 (1993-11-11) column 2, line 25 - line 37 column 3, line 7 - line 28 figure 1A	10,17
Y	PATENT ABSTRACTS OF JAPAN vol. 018, no. 092 (P-1693), 15 February 1994 (1994-02-15) & JP 05 296934 A (SANYO ELECTRIC CO LTD), 12 November 1993 (1993-11-12) abstract	18
Y	DE 90 17 745 U (DRÄGERWERK AG.) 5 December 1991 (1991-12-05) page 10, line 19 -page 11, line 18; figure 1	19

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/01431

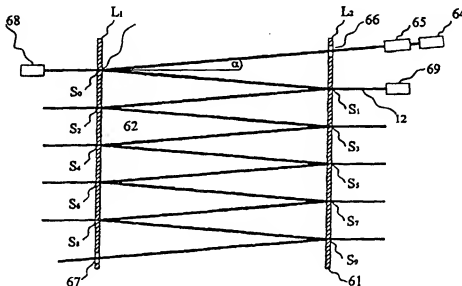
Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5835231 A	10-11-1998	US 5986768 A	16-11-1999
JP 55039049 A	18-03-1980	JP 1341010 C	14-10-1986
		JP 61005616 B	20-02-1986
DE 4214840 A	11-11-1993	NONE	
JP 05296934 A	12-11-1993	NONE	
DE 9017745 U	05-12-1991	NONE	



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : G01N 21/03, 21/31		A1	(11) International Publication Number: WO 00/65328
			(43) International Publication Date: 2 November 2000 (02.11.00)
(21) International Application Number: PCT/GB00/01431		(81) Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BI, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TO).	
(22) International Filing Date: 14 April 2000 (14.04.00)			
(30) Priority Data: 9909319.7 22 April 1999 (22.04.99) GB			
(71) Applicant (for all designated States except US): SHIMADZU RESEARCH LABORATORY (EUROPE) LTD. [GB/GB], Wharfside, Trafford Wharf Road, Manchester M17 1GP (GB).			
(72) Inventor; and (75) Inventor/Applicant (for US only): SMITH, Alan, Joseph [GB/GB], 11 Nettleton Grove, Blackley, Manchester M9 4BQ (GB).		Published With international search report.	
(74) Agent: MATHISEN, MACARA & CO.; The Coach House, 6-8 Swakeleys Road, Ickenham, Uxbridge, Middlesex UB10 8BZ (GB).			

(54) Title: APPARATUS AND METHOD FOR MEASURING DECAY IN INTENSITY OF ELECTROMAGNETIC RADIATION IN MULTIPASS SPECTROMETRY



(57) Abstract

An apparatus for measuring decay in intensity of electromagnetic radiation passing through a radiation-absorbent sample (62) due to absorption of radiation by the sample, includes a source (64) of electromagnetic radiation having a wavelength within an absorption band of the sample and a plurality of partially-reflective specular surfaces (S0, S1, S2...) which are spaced apart from each other along a predetermined path through the sample. Each specular surface separates the incident radiation into a reflected part which follows the predetermined path and an unreflected path. A value of the decay is derived from intensity measurements of the unreflected parts made at different positions along the predetermined path.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	JP	Japan	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	KE	Kenya	NL	Netherlands	VN	Viet Nam
CG	Congo	KG	Kyrgyzstan	NO	Norway	YU	Yugoslavia
CH	Switzerland	KP	Democratic People's Republic of Korea	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire			PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 4/W32300WO	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 01431	International filing date (day/month/year) 14/04/2000	(Earliest) Priority Date (day/month/year) 22/04/1999
Applicant SHIMADZU RESEARCH LABORATORY (EUROPE) LTD		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.
☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

APPARATUS AND METHOD FOR MEASURING DECAY IN INTENSITY OF ELECTROMAGNETIC RADIATION IN MULTIPASS SPECTROMETRY

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

6
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 00/01431

B x lii TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

Line 2 : Add "(62)" after "radiation-absorbent sample";
Line 3 : Add "(64)" after "source";
Line 4 : Add "(S0,S1,S2...)" after "surfaces";

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 08 December 2000 (08.12.00)	
International application No. PCT/GB00/01431	Applicant's or agent's file reference 4/W32300WO
International filing date (day/month/year) 14 April 2000 (14.04.00)	Priority date (day/month/year) 22 April 1999 (22.04.99)
Applicant SMITH, Alan, Joseph	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

15 November 2000 (15.11.00)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Pascal Piriou
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38